

ACQUISITIONS TO THE MOSS AND LIVERWORT
FLORA OF THE NETHERLANDS

BY

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A growing interest in the study of the bryophytes has become evident in the last decade. This interest has been strongly stimulated by the many excursions which the "Bryologische Werkgroep" has held nearly all over the country. Moreover, the fact that bryophytes are dominant in some special habitats (tree trunks, Sphagneta) has induced quite a few biologists, interested in plantsociology, to study them intensively. This revival has led to many results in the investigation of our moss flora, particularly in the discovery of a number of new and rare species.

An earlier publication (N.K.A. 57: 281, 1950) has already given a number of these and an additional number have been briefly dealt with in the periodical "Buxbaumia".

There is another circumstance which has contributed to a better knowledge of our bryophytes. The strong growth of our population has caused a great demand for arable land. Consequently, many waste lands have been reclaimed, bogs and marshes drained, brooks canalised, etc. It therefore became imperative to preserve as many of our incomparable moors, marshes, etc. as possible. Their value as future nature reserves had first to be assessed from an accurate survey of their fauna and flora. Naturally this also included the bryophytes.

It cannot be gainsaid that a general impoverishment of our moss flora has taken place in the course of the last century. Many tracts of wild land have disappeared whilst the increasing industrialisation of the country has made large areas unsuited for the growth of mosses. Many species which were quite common a century ago are now limited to a few localities e.g. *Antitrichia curtispendula* and *Neckera pumila*, while other, rarer mosses have probably become extinct: e.g. *Splachnum ampullaceum* and *Cinclidium stygium*. It is to be feared that this impoverishment will proceed at an increasing rate in the future. Nevertheless a number of new indigenes have been discovered as well as an additional number of rare and remarkable species. This publication mentions 18 new indigenous species, of which 13 are Musci and 5 Hepaticae. In addition it mentions 5 new varieties (Musci) of which 3 are new to science, and 20 new records of rare bryophytes (14 of mosses and 6 of liverworts).

SPECIES AND VARIETIES NEW TO OUR FLORA

A. MUSCI

Barbula gracilis Schwaegr.

Leg. A. J. H. M. VAN DE VEN, 1-10-1949, Achtbundersweg, V6. 23.13, Schin-op-Geul, prov. of Limburg, in a *Mesobrometum* on cretaceous limestone (Maestrichtien).

Most of the differences between *Barbula gracilis* and *Barbula fallax*, indicated by DIXON (1924), are unreliable: both have the nerve much protruding at the back of the leaves and often quite flat on the ventral side; in neither of the species there is a difference between the leaf cells on the nerve and those on the lamina; they are very short in the upper part of the leaf, more or less elongated towards the base, both on nerve and lamina. As a rule those in *Barbula fallax* remain very short to the base, while those of *Barbula gracilis* are distinctly longer near the base. In the material from S. Limburg, however, the basal cells are short, but the same was observed by me in an exsiccate from Upsala (Sweden). On the other hand, exsiccates of *B. fallax*, collected by BROTHNERUS, proved to have much elongated basal cells!

In my opinion the most reliable differences between *Barbula gracilis* and *Barbula fallax* are the smooth leaf cells of the former in contrast to the papillose cells of the latter, and the position of the leaves: in *Barbula gracilis* straight and closely appressed when dry, erecto-patent when moist, in *Barbula fallax* somewhat twisted when dry, squarrosely recurved when moist. Generally too, the leaves of *Barbula gracilis* have a longer and narrower acumen and a nerve which is sometimes excurrent.

J. J. B.

Barbula sinuosa Braithw.

Leg. J. J. BARKMAN, no. 3699, 10-10-1951, N. of Deventer, M6. 65.22, prov. of Overijsel, on the base of a pollard-willow in foreland of river IJsel, flooded in winter, rel. ¹ 1397.

Although MOENKEMEYER (1927) includes this species as a variety of *Barbula cylindrica* (Tayl.) Schimp., I consider it distinct enough to give it specific rank; see also DIXON (1924: 215-216).

J. J. B.

Bryum capillare Hedw. var. **rosulatum** Mitt.

Leg. J. J. BARKMAN, no. 3685, 7-8-1951, Linde valley, Oldeberkoop, K6.15.22, prov. of Friesland, on stumps of *Fraxinus* in moist ash-alder-coppice, rel. 1085.

The aspect of this variety is strikingly similar to that of *Rhodobryum roseum*. The leaves are crowded in a terminal rosette, squarrosely recurved when moist, shrinking, but widely spreading and not spirally twisted when dry, very large (3½-4½ mm long), with entire, recurved margins and mostly percurrent nerve.

J. J. B.

¹ In this paper "rel." stands for plantsociological "relevé" (sample plot survey).

Bryum funckii Schwaegr.

Leg. A. J. H. M. VAN DE VEN: 1-10-1949, Wahlwiller, V6.33.42, prov. of Limburg, initial stage of *Mesobrometum* on loose cretaceous marl (Gulpens); 30-9-1949, Schiepersberg between Bemelen and Houthem, V6.21.23, prov. of Limburg, *Mesobrometum* on cretaceous chalk rocks (Maestrichtien).

Both samples have about 1 cm. long, very fragile, catenulate stems. All leaves are of the same size and shape, i.e. very small (0.5 mm long and nearly as broad), of a very thin texture, concave with flat, but not recurved, entire margins without border. The leaf cells are all wide, shortly hexagonal and thinwalled. The nerve is strong, reddish at base, otherwise dark green or brownish, ending in apex or excurrent in a short apiculus.

This is a calciphilous species, known from Central-Europe, so it could be expected here.

Quite a different matter is the question whether this species — like so many other species of *Bryum* based exclusively on gametophyte characters — can be looked upon as a sound species. In my opinion it is quite possible that *Bryum funckii* merely represents a variety of either *Bryum argenteum* or *Bryum caespiticium*.
J. J. B.

Calliargon megalophyllum Mikutowicz

Leg. W. MEYER, April 1948, Belversven, prov. of N. Brabant.

In the last five years *Calliargon megalophyllum*, a species mentioned by MIKUTOWICZ in his *Bryotheca Baltica*, no. 141 (1918), has received attention from the Scandinavian bryologists TUOMIKOSKI (1937, 1940) and JENSEN (1939).

At first sight the differences between *Calliargon megalophyllum*, *Calliargon giganteum* and *Calliargon richardsonii* seemed so slight to me, that I was dubious as to the specific rank of the first named. However, through the kind intervention of Dr PERSSON I was able to send all my Dutch *Calliargon* material to Dr TUOMIKOSKI, who named one of my specimens *Calliargon megalophyllum* and sent me fine Finnish samples for comparison. The study of his material quite convinced me of the specific rank of *Calliargon megalophyllum*.

Calliargon megalophyllum differs from *Calliargon giganteum* in the absence of the numerous lateral branches with smaller leaves so characteristic of the latter, and by the smaller auricles not reaching the nerve. The nerve itself is less pronounced than in *Calliargon giganteum*. From *Calliargon richardsonii* it may be known by the longer nerve reaching the apex, the green colour, instead of a red tendency in *Calliargon richardsonii*, and the dioicous inflorescence.

Up to now *Calliargon megalophyllum* has been reported from Norway, Sweden, Finland and Russia by TUOMIKOSKI (1940), and was supposed to be boreal-continental. This new record from Holland is far to the southwest of the known localities.

The habitat of *Calliargon megalophyllum* in the Belversven is similar to most of the Scandinavian stations. The pH of the open water ranged

from 6.6–7.0 (VAN HEUSDEN, 1949). Our *Calliargon* was found along the fen margin, 1–2 dm submerged, among *Carex inflata*, *Phragmites communis*, *Schoenoplectus lacustris*, *Glyceria spectabilis* and *Sparganium minimum* in the upper herblayer, and *Menyanthes trifoliata* and *Comarum palustre* in the lower herblayer, while *Hydrocharis* was floating.

W. M.

***Dicranoweisia crispula* (Hedw.) Lindb.**

Leg. W. D. MARGADANT and N. E. NANNENGA-BREMEKAMP, herb. N.E.N.-B. no. 1079, 15–8–1950, Hoge Veluwe, prov. of Gelderland, on concrete wall.

From a single very compact, dark greyish tuft, growing about 1½ m up an exposed concrete wall, a part was collected. This sample proved to be different from the in the Netherlands common *Dicranoweisia cirrata* in the following points: the longer narrower leaves with plane margins and the small inflated auricles. We therefore refer this specimen to *Dicranoweisia crispula*.

Geographically the occurrence of this mountainous species here is

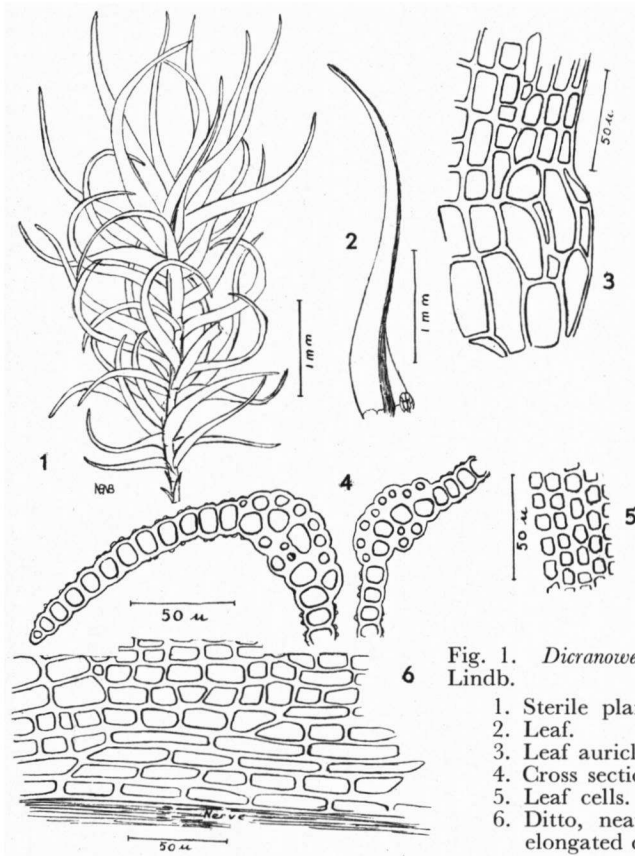


Fig. 1. *Dicranoweisia crispula* (Hedw.) Lindb.

1. Sterile plant.
2. Leaf.
3. Leaf auricle.
4. Cross sections of leaves.
5. Leaf cells.
6. Ditto, near the base, showing elongated cells next to the nerve.

remarkable; it may have been imported with the Maulbrunner sandstone, which was deposited in the vicinity of the wall, but on which our moss was not found. On the other hand it may have arrived by wind from more mountainous regions, perhaps via isolated rocks in the Northern German Plain from where there are some records too. (Fig. 1)

W. D. MARG. and N. E. N.-B.

Dicranum fuscescens Turn. var. **falcifolium** Braithw.

Leg. W. MEYER, April 1950, Speulderbos, N5.17.24, prov. of Gelderland, on an oak tree.

This is a variable species and sometimes difficult to distinguish from *Dicranum mühlenbeckii* B. et S. The latter differs chiefly in the highly tomentose stems, the leaves more crisped when dry, strongly tubular above, and coarsely denticulate. *Dicranum fuscescens* occurs mainly in mountainous districts; in the Alps up to 2800 m altitude, on moors, rocks etc., in Scandinavia, Great-Britain, N. Germany, Belgium (practically only in the "district Ardennais") and even in Spitsbergen. The variety is much less common.

W. M.

Dicranum strictum Schleich.

Leg. W. D. MARGADANT, no. 822 and N. E. NANNENGA-BREMEKAMP, no. 722, 2-4-1950, Molenbeek, Renkum, P5.28.23, prov. of Gelderland, in the fissures of oak bark; leg. N. E. NANNENGA-BREMEKAMP, no. 2380, 4-6-1953, Heelsum, prov. of Gelderland, on and around stumps in a beechwood.

A small *Dicranum* growing in the fissures of the bark of an old oak was collected near Renkum. There was a superficial resemblance to *Dicranella heteromalla*, but our specimens had straight leaves. Under the microscope the resemblance disappeared altogether with the presence of well developed auricles. The long, entire, brittle leaves pointed to *Dicranum strictum*. Leaf section verified this since there were no stereid cells in the nerve, as is the case in the closely allied *Dicranum viride*.

Geographically it is an interesting plant with a mainly mountainous distribution, and only sporadically encountered in low countries: there are records from the Northern German Plain, from Brittany and from England. (Fig. 2)

W. D. M. and N. E. N.-B.

Grimmia apocarpa Hedw. var. **bistratosa** Barkman nov. var.

Leg. J. J. BARKMAN, no. 3632 (type specimen in Rijksherbarium, Leiden), 16-7-1951, Krimpen a/d Lek, P4.41.43, prov. of Z. Holland, on the base of a pollard-ash (South side of trunk) in marshy foreland of the river Lek, flooded twice a day by fresh water, rel. 964.

Differt laminis foliariis bistratosis in tota parte dimidia superiore foliorum, unde per laminam unistratosam descendunt fere usque ad basim fasciae bistratosae longitudinales nonnullae.

I consider this specimen to belong to *Grimmia apocarpa* Hedw. on account of the stem which lacks a central strand, of the leaves which are squarrose in all directions when moist, large, broadly ovate-

lanceolate, acute, not concave, strongly keeled, with an entire apex which is either mucicous or provided with a very short, toothed, hyaline hairpoint, and on account of the percurrent nerve which is of equal thickness ($65\ \mu$) throughout the leaf, smooth at back, plan-convex and of a rather homogeneous cell structure.

The leaf margins are strongly recurved 2-3-stratose and entire. The laminal cells are smooth, rounded or transversely oval, incrassate, and not sinuose at all; in the perichaetial leaves the basal cells are rather hyaline, thin-walled, and elongated.

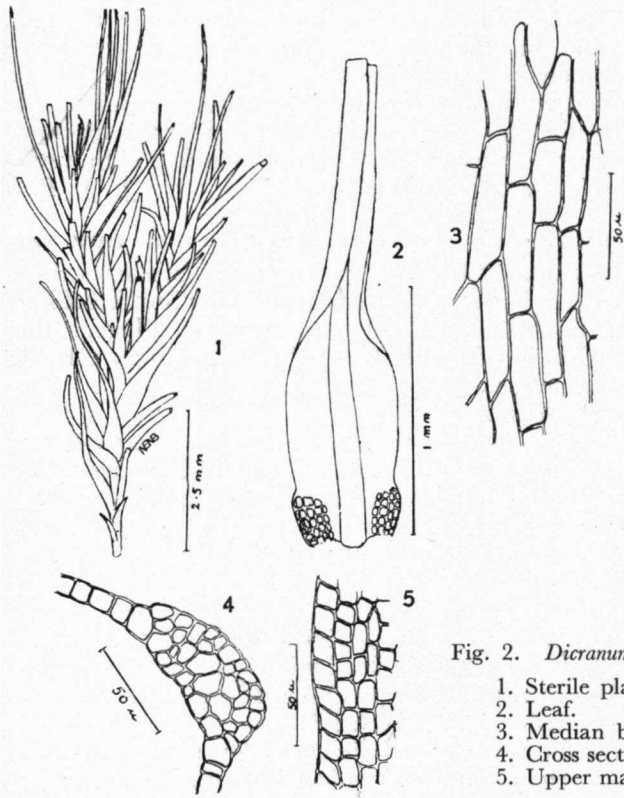


Fig. 2. *Dicranum strictum* Schleich.

1. Sterile plant.
2. Leaf.
3. Median basal leaf cells.
4. Cross section of leaf.
5. Upper marginal leaf cells.

The whole upper half of the leaves has a bistratose lamina and from there many longitudinal bistratose bands extend throughout the lower part reaching nearly to the base. This gives the moss a strange appearance under the microscope, somewhat resembling *Coscinodon cribrosus*, but the bistratose bands scarcely project beyond the leaf surface and the leaves are not plicate. The margin and sometimes the lamina of *Grimmia apocarpha* are described as bistratose, but only at apex and the bistratose bands are not mentioned.

LIMPRICHT (1890-1904, 1: 713) mentions a bistratose lamina for *Schistidium atrofusum* (Schimp.) Limpr. = *Grimmia apocarpha* var. *atrofusca*

Husnot; he says: "Lamina am Rande und (streckenweise schon oberhalb des Grundes) oberwärts in der ganzen Breite doppelschichtig und schwärzlich". The remark between parentheses (spaced by me) suggests the existence of bands similar to those of the present *Grimmia*. The colour of the moss (blackish) is the same, too. However, the var. *atrofusca* has a distinct central strand, the leaves are erecto-patent when moist, small and subobtusate, concave at the base and with a flat margin in the upper part. Moreover, the habitat and distribution (calcareous rocks in the Alps, above 1800 m altitude) are quite different as well. *Grimmia maritima* has leaves with a bistratose upper part and stems with only a small, indistinct central strand, but the leaves are somewhat contorted when dry, concave and scarcely keeled, whereas the nerve is rough at back, biconvex and provided with two large strands of stereids. Moreover, the leaf apex is not hyaline. So I cannot help but consider the specimen under discussion to represent a new variety, not identical with any of the varieties and species described hitherto. J. J. B.

***Orthotrichum lyelli* Hook. et Tayl. var. *laeve* Barkman nov. var.**

Leg. J. J. BARKMAN no. 2930 (type specimen in Rijksherbarium, Leiden), 22-9-1950, Leens between Zoutkamp and Warffum, H6.18.24, prov. of Groningen, on old elm along roadside near village, rather exposed, N. W.-N. E. side of trunk, 88°-91°, 2-3 m high, rel. 518 (*Tortuleto-Ulotetum phyllanthae*).

Differt cellulis foliaribus laevibus.

Though sterile, the specimen may safely be referred to *Orthotrichum lyelli* Hook. et Tayl., on account of the long leaves with brown gemmae on their surface and the flat margins, which are irregularly toothed near apex.

The leaf cells are completely devoid of papillae! J. J. B.

***Orthotrichum rivulare* Turn.**

Leg. J. J. BARKMAN, no. 3634, 20-7-1951, Spijkenisse, P3.55.32, prov. of Z. Holland, on the base of a pollard-willow in low, wet willow-coppice on river-clay along the river Oude Maas. Base of trees flooded by fresh water twice a day. Rel. 974.

In spite of a careful and prolonged search only one stem with about 5 leaves and a few archegonia at apex could be found. The leaves are very typical: broadly ovate-oblong with a rounded apex, recurved margins, small, pellucid, incrassate, irregularly rounded lamina cells with low papillae and a nerve which ceases below the apex.

Since this species was known from Great-Britain, Belgium and Germany, it could be expected here, though it seems to be a more or less mountainous species. It occurs in similar habitats abroad. J. J. B.

***Orthotrichum tenellum* Bruch var. *decipiens* Vent. fo. *gemmiferum* Barkman nov. forma.**

Leg. J. J. BARKMAN, no. 4069 (type specimen in Rijksherbarium, Leiden), 5-7-1951, near Heusden, W. of Nederhemert, Q4.28.42,

prov. of Gelderland, on the trunk of a pollard-willow in a meadow, N. side, 62°–81°, 0.5–1.2 m above the soil, rel. 925.

Differt laminis foliorum utrinque copiose gemmiferis; gemmae vel ellipticae, unicellulares, 40 μ longae, 34 μ latae, vel oblongae usque ad filiformes, sub-claviformes, 3–12 cellulares, 60–180 μ longae, 29–36 μ latae, semper fuscae, cellulis incrassatis.

Gemmae have not yet been reported for this species, as far as I know. On account of the abundant laminal gemmae as well as the rather obtuse leaves with strongly incrassate, rounded cells, one is at first glance inclined to believe that this moss belongs to *Orthotrichum obtusifolium* (which, by the way, was growing mixed with it!), but thanks to the presence of capsules it is quite certain that it belongs to *Orthotrichum tenellum*, which it resembles in all other characters. It belongs to the Central-European var. *decipiens* Vent., which has ribs of 4 rows of cells on the capsule walls. J. J. B.

***Pottia lanceolata* (Hedw.) C. Müll. var. *gasilieni* (Vent.) Corbière.**

Leg. A. J. H. M. VAN DE VEN, 1–10–1949, Karstraat, Voerendaal, V6.23.12, prov. of Limburg, in grass on cretaceous rocks (Maestrichtien).

The plants were nearly completely buried in the dusty marl. The lower leaves are small, the upper large, oblong and obtuse, the comal leaves still longer (1.6 mm), ovate, acute, spirally twisted when dry, with broadly revolute margins from base to near apex; the nerve is somewhat thickened near apex, with spongy tissue on its ventral face, consisting of thin-walled cells, each with a conical papilla. The lamina cells are smooth. The nerve is excurrent in a rather long, brown hairpoint, 1/9–1/3 of the length of the lamina. Flagellae are sometimes found at the apex of the stem, bearing minute leaves (0.5–0.8 mm long and 0.3–0.4 mm broad).

VENTURI (1894) considered this moss to be a species of *Desmatodon* (*D. gasilieni*), LIMPRICT (1890–1904) called it *Tortula gasilieni*, MOENKEMEIJER (1927) considered it a variety of *Tortula atrovirens* (Sm.) Lindb. Perhaps this variety deserves specific rank, but at any rate it belongs to the genus *Pottia*, not to the genus *Tortula*. This was already pointed out by CORBIÈRE (1895: 34); his opinion is joined by THÉRIOT and (according to private communications) by GAUME and POTIER DE LA VARDE.

The only localities, where it has been found, are Constantine (Alger) and a few places on the W. coast of N. France (peninsula of Cherbourg, Le Havre, Boulogne), on maritime calcareous sand!

My thanks are due to Mr. GAUME (Paris) and Mr. POTIER DE LA VARDE (Lez-Eaux par St. Pair/mer) for their valuable information on the taxonomy and distribution. J. J. B.

***Seligeria calcarea* Br. et Schimp.**

Leg. A. J. H. M. VAN DE VEN, 1–10–1949, Wahlwiller, V6.33.42, prov. of Limburg, in a *Mesobrometum* on calcareous soil.

The species was detected in a sample mainly consisting of other

mosses. Only five plants were present, on a small piece of marl. Four of them had young sporogons. The gametophytes therefore have to be considered adult; yet they were only 0.75 mm high. Each consisted of a rosette of leaves (slightly more than 0.5 mm long) and a tuft of white rhizoids at the base of the rosette. The whole appearance of the moss is like that of a minute *Isoetes* plant; this impression is also due to the dark green, rigid, succulent and erecto-patent leaves. The succulent texture is caused by the thick nerve occupying the whole breadth of the upper leaf part and ending in an obtuse point.

It may be remarked here that DIXON (1924) has not included the genus *Seligeria* in his keys based on gametophyte characters.

Moreover, the sporogons of our plants were too young to yield useful characters. Consequently, when using DIXON for the identification it was not possible to arrive at a satisfying result. I will therefore give supplementary notes to some of his keys here.

Table V (p. XLV) no. 10 has to be changed as follows:

10a.	Ls. usually lanceolate	11	
b.	Ls. usually ovate	78	<i>Bryum</i>
11a.	Nerve reaching the subulate apex; ls. very small	13	<i>Seligeria</i>
b.	Nerve not reaching apex; apex not subulate, acute or subacute only	11'	
11'	see no. 11 of DIXON.		

In the same table no. 18 has to be changed as follows:

18a.	Cells small, rounded	49	<i>Zygodon</i>
b.	Cells more or less quadrate or oblong	18'	
18'a.	Stem tall (at least 1 inch); leaf margin entire at base	70	<i>Bartramia</i>
b.	Stem very short (less than 2 lines); ls. finely denticulate all round	13	<i>Seligeria</i>

Finally, no. 23 also has to undergo a change:

23a.	Ls. short, scarcely $\frac{1}{2}$ line long	23'	
b.	Ls. longer, usually over 1 line long	24	
23'a.	Nerve occupying the whole subulate upper part of the leaf	13	<i>Seligeria</i>
'	Lamina distinct throughout	49	<i>Zygodon</i>

The species was growing mixed with *Camptothecium lutescens*, *Pseudoscleropodium purum*, *Cylindrothecium concinnum*, *Abietinella abietina*, *Fissidens adiantoides*, *Rhytidiadelphus triquetrus*, *Calliergonella cuspidata*, *Ctenidium molluscum*, *Campylium chrysophyllum*, *Thuidium philiberti*, *Amblystegium serpens*, *Mnium rostratum*, *Bryum capillare*, *Oxyrrhynchium praelongum*, *Brachythecium glareosum*, *Barbula unguiculata* and the lichen *Cladonia pyxidata*, all in one sample!

Seligeria calcarea is, as its name suggests, a typical calciphilous moss. On account of its minute size (it is probably the smallest moss of our flora) it is very inconspicuous. To a certain extent this is outweighed by the fact that it usually occurs in great masses. The species was described as long ago as 1790 (by DICKSON) and as it is easy to distinguish from its allies, we meet it in most of the European moss flora's, the very old ones included, which proves that its existence was known to

many students. Therefore a reliable map of its distribution can be based on these flora's (fig. 3). From this map it will be evident that the area is a most interesting one: restricted to N. W. Europe with a centre of dispersal on both sides of the Channel. Beyond this centre the species is extremely rare, for instance in Germany of which the moss flora has been thoroughly investigated. J. J. B.

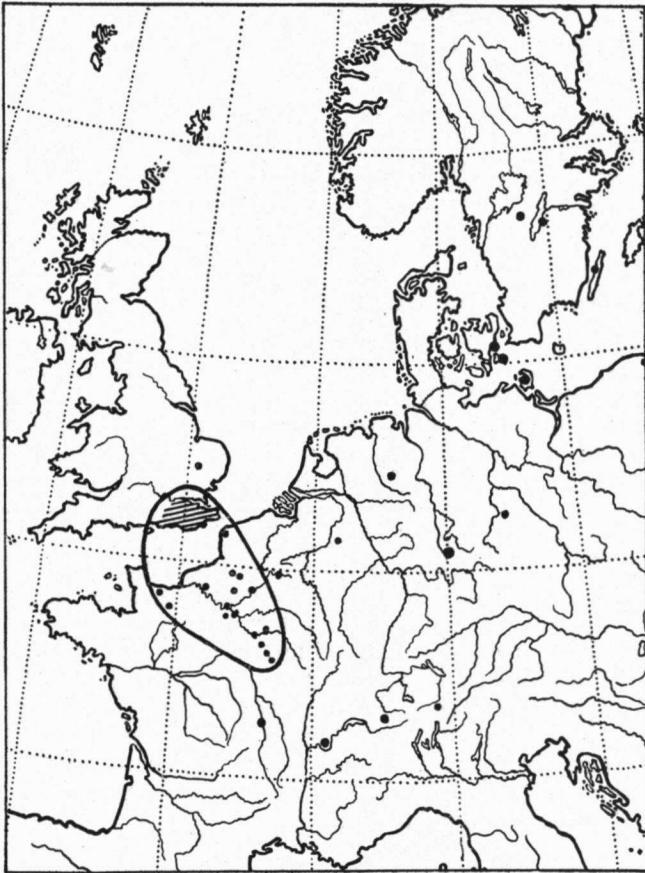


Fig. 3. Distribution of *Seligeria calcarea* Br. et Schimp.

***Tortella inclinata* (Hedw. fil.) Limpr.**

Leg. A. J. H. M. VAN DE VEN, 1-10-1949, Kunraderberg, Heerlen, V6.23.22, prov. of Limburg, in a *Mesobrometum*.

The specimens grew in large flat dense mats of a dirty dark olive-brown colour. The plants were only 1-1.5 cm high, the leaves not tortuose when dry, only rather strongly incurved; when moist, they were patent, but incurved at apex. A stem epidermis was present. The central strand was lacking, but, according to DIXON (1924), this

character is not fully reliable if used to distinguish *Tortella inclinata* from *T. flavovirens*. I therefore give this record with some hesitation. The colour of the moss, as well as its stem anatomy, however makes it probable that it belongs to *Tortella inclinata*. I have also seen material of *T. flavovirens* from S. Limburg. This showed the yellow-green colour and much tortuose leaves, typical of that species, and was quite different in appearance. It may be noticed that WACHTER (in JANSEN & WACHTER, 1943), regarded *T. inclinata* as a synonym of *T. flavovirens*, but in this opinion he is supported by very few bryologists.

J. J. B.

Tortula guepinii (Br. et Schimp.) Limpr.

Leg. J. J. BARKMAN, no. 2802, 18-9-1949, St. Pietersberg, Maastricht, prov. of Limburg, in chalk grassland (*Mesobrometum*).

Up till now this species had only been found in France (5 localities) and California. For further details I may refer to BARKMAN (1953).

J. J. B.

Trichostomum crispulum Bruch.

Leg. W. MEIJER, June 1946, Gerendal, prov. of Limburg, on a dry calcareous slope (det. E. A. and W. M.); leg. A. J. H. M. VAN DE VEN: 2-10-1949, Gerendal, V6.22.41, prov. of Limburg, in a *Mesobrometum*; 30-9-1949, Schiepersberg between Bemelen and Houthem, V6.21.23, prov. of Limburg, on rocks of cretaceous limestone (Maestrichtien) in a *Mesobrometum* (both det. J. J. B.); leg. N. E. NANNENGA-BREMEKAMP, no. 1055, 4-4-1949, Geulem, prov. of Limburg, limestone, with *Ditrichum flexicaule* (det. N. E. N.-B.)

This species is characterised by the narrow, tapering, entire and shortly mucronate leaves with cucullate apices. It is not surprising to find it in our calcareous district: it is a calciphilous moss, mainly occurring in S. Europe, but extending through Central Europe as far as Great Britain, Norway and Sweden. One of us (J. J. B.) found the species near Bettyhill (N. coast of Scotland), in moist dune valleys of calcareous sand mixed with much gravel, immediately behind the beach. It is therefore somewhat surprising that the moss has never been found in the calcareous dunes of Holland; nor has it been reported from the French and Belgian dunes.

var. *brevifolium* Br. et Schimp.

Leg. A. J. H. M. VAN DE VEN, 1-10-1949, Overeijs, V6.34.11, prov. of Limburg, in a *Mesobrometum* (det. J. J. B.)

J. J. B., W. M. and N. E. N.-B.

Weisia crispata C. Müll.

Leg. A. J. H. M. VAN DE VEN, 1-10-1949, Eyser berg, V6.33.21, prov. of Limburg, in a *Mesobrometum*.

Although the material is scarce and sterile, I consider it to belong to this species on account of the leaf shape. The species is sometimes considered as a variety (var. *fallax*) of *Weisia tortilis* (= *Hymenostomum*

tortile). The latter species was already known from our country, but the variety was not. These two closely related species (or subspecies or varieties) clearly prove that *Hymenostomum* cannot be separated from *Weisia* as a genus, not even as a section, for that would mean that the two species belong to different sections which is quite unnatural. See also DIXON (1924) and MOENKEMEIJER (1927).]

Weisia crispata had been found in Great Britain and Germany and was to be expected here.

J. J. B.

B. HEPATICAE

Fossombronina pusilla (L.) Dum.

Leg. N. E. NANNENGA-BREMEKAMP, no. 2168, 13-9-1952, Botanical Garden "De Wolf", Haren, prov. of Groningen, at the base of a rockery, on moist ground.

A revision of *Fossombronina pusilla* in the herbarium of the K.N.B.V. by WACHTER resigned all the specimens there to other species because of their spore structure (JANSEN & WACHTER, 1935). Since then there are no records of *Fossombronina pusilla* from the Netherlands.

At the time the above specimen was collected, no sporangia were visible, and only when several had ripened a month later, the plants were examined and proved to belong to *Fossombronina pusilla*: the spores had 17-20 spines on the circumference, and not 25-32 as in *Fossombronina wondraczeki*, the only other *Fossombronina* with ridges not forming meshes on the spores. The inner sporangium wall too, is different, having brown semicircular thickenings on the cell walls. (Fig. 4)

W. D. MARG. and N. E. N.-B.

Leptoscyphus taylori (Hook.) Mitt.

Leg. J. J. BARKMAN, no. 3698, 18-9-1951, Huis "Twikkel", M7.66.13, Delden near Hengelo, prov. of Overijssel, on the base of an old birch at the edge of a small marshy pond in a tall, dense spruce wood; rather light, but much sheltered, in a moist atmosphere, together with *Lepidozia reptans* and *Ptilidium pulcherrimum*. Rel. 1450.

This curious specimen differs from both *Leptoscyphus anomalus* and *L. taylori* in the following characters: rhizoids are scarce and lacking in the upper part of the stems which are erect; amphigastria are equally scarce; the stems bear clusters of gemmae at their tips, and the leaf cells are only 24-38 μ . However, a few subulate amphigastria have been found. The leaves are orbicular and trigones are very large, nodulose. Moreover, the apical leaves bear 1-2-celled oval gemmae at their margin. So I consider this to be a *Leptoscyphus*, and more particularly *L. taylori*, since the cuticula of the leaves is verrucose (visible on cross-sections of the leaves) and the gemmae bearing leaves are orbicular, without elongated cells.

Although this species is known from Great-Britain and Central Europe (from the Alps to Scandinavia), its discovery in the Netherlands is rather surprising since it mainly occurs in the mountains.

J. J. B.

Lophozia porphyroleuca (Nees) Schiffn.

Leg. E. AGSTERIBBE, no. 1233 and S. GROENHUIJZEN, 21-9-1951, Mosbeek near Vasse, prov. of Overijssel, on a steep bank, facing north, near a brook (Mosbeek).

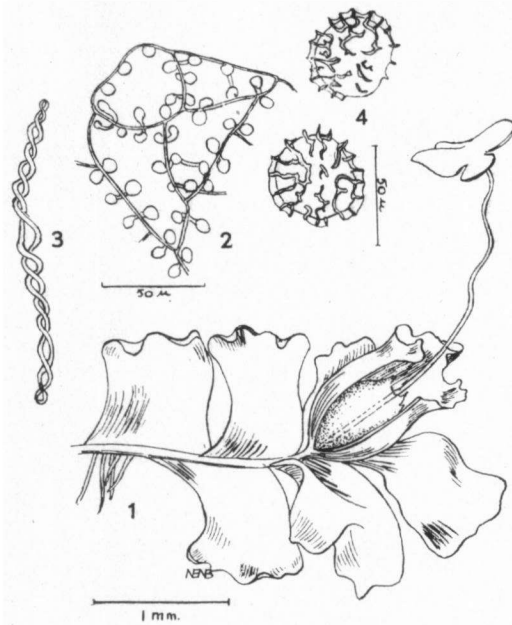


Fig. 4. *Fossombronina pusilla* (L.) Dum. 1. Fertile plant. — 2. Detail of inner sporangium wall. — 3. Elater. — 4. Spores.

The bank on which this hepatic grew was sparsely covered with shrubs of *Vaccinium Vitis-idaea* L. and, being moist and shady, it had a rich liverwort vegetation, a. o. *Lepidozia setacea*, *Nardia geoscypha* and *Calyptogeia neesiana*.

Some of the older hepatologists (a.o. K. MÜLLER) considered this hepatic a variety of *Lophozia ventricosa*, but nowadays it is held to be a good species (BUCH, EVANS & VERDOORN, 1938).

In the typical form, as it was encountered here, it is quite different from *Lophozia ventricosa*. The dark reddish-brown colour, reddish leafbase and the leafcells with large trigones will separate it at once from this species. It is usually a plant of the subalpine and alpine regions and appears to be widely distributed all over Europe, though nowhere common. It has a preference for organic substratum, for decaying wood, peat, etc.

E. A. and S. G.

Microlejeunea ulicina (Tayl.) Evans

Leg. J. J. BARKMAN, no. 3552, 20-4-1951, Beekhuizen near Velp (Arnhem), P6.14.31, prov. of Gelderland, on the base of a rather young beech in a beech wood on acid sandy soil, rel. 706; no. 3557, 21-4-1951,

Middachterbos between Velp and Dieren, P6.15.14, prov. of Gelderland, on a 70 years old *Quercus borealis* in open wood (*Querceto-Carpinetum*) on riverclay, N. side of trunk, 72°, 1-2 m high, rel. 721.

This minute atlantic hepatic had not yet been recorded from the Netherlands. Nearest finds: Luxemburg, Normandy, Great-Britain, S. W. Norway. J. J. B.

Pellia neesiana (Gottsche) Limpr. (Fig. 5)

Leg. W. MEIJER: 1947-1950, nature reserve Naardermeer, and Kortenhoefse plassen, prov. of N. Holland; Kierse Weide, NW. part of prov. Overijssel; leg. Bryol. Werkgroep, 22-9-1951, Mosbeek near Vasse, prov. of Overijssel.

All these records are from very wet habitats, often with *Phragmites communis* and *Dryopteris thelypteris*. Probably it has often been overlooked.

A key to the indigenous species of *Pellia* follows:

- 1a. Thallus with thickened bands (best seen in longitudinal section). Calyptra exserted; inner wall of capsule with numerous semiannular thickenings 2
 - b. Thallus without thickened bands. Calyptra included; inner wall of capsule without semiannular thickenings *P. endiviaefolia*
 - 2a. Margin of involucre absent on the side towards apex of thallus. Paroicous *P. epiphylla*
 - b. Involucre forming a complete ring; mouth erect. Dioicous *P. neesiana*
- W. M.

Riccia warnstorffii Limpr.

Leg. W. MEIJER, 29-4-1952, Gronsveld, Maastricht, prov. of Limburg, in an abandoned cloverfield, together with *Riccia bifurca*; leg. E. AGSTERIBBE, no. 1230, 12-9-1952, Botanical Garden "de Wolf", Haren, prov. of Groningen, on a little used path, together with *Riccia beyrichiana* and *R. sorocarpa*.

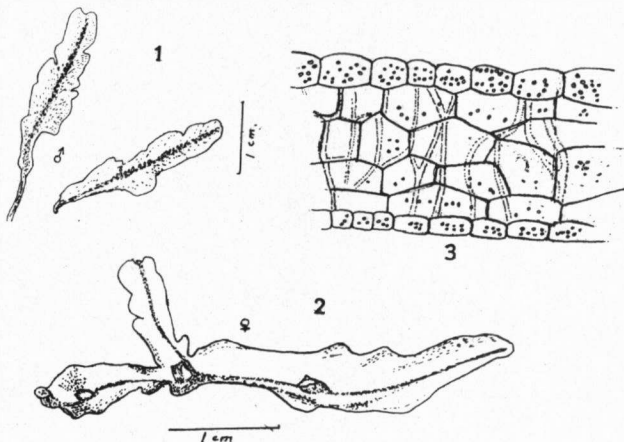


Fig. 5. *Pellia neesiana* (Gottsche) Limpr. 1. Thallus with antheridia. — 2. Thallus with archegonia. — 3. Section of thallus.

Characteristic of this species is the shape of the cross-section of the thallus and the form and branching of the segments. It is closely allied to *R. commutata* but differs by the light-green colour and the obtusely pointed margins of the thallus. According to K. MÜLLER (1916) this hepatic occurs solely north of the Alps.

E. A. and W. M.

II. NEW RECORDS OF RARE AND CRITICAL SPECIES

A. MUSCI

Amblystegium kochii Br. eur.

Leg. J. J. BARKMAN: no. 3673, 6-5-1951, S. W. of Katwijk, N3.36.13, prov. of Z. Holland, on old stems of *Sambucus nigra* in a dense thicket in a wet dune valley, rel. 811; no. 3633, 22-7-1951, Biesbos, Q4.23.14, prov. of N. Brabant, on the base of a pollard-willow in a willow coppice, flooded by fresh water twice a day, rel. 998.

These are the second and third localities of the species in the Netherlands. The first record (Zwolle) was by WACHTER from the collection of LAKO (JANSEN & WACHTER, 1940). The two records in the Prodrômus (1893) are based upon erroneous determinations.

J. J. B.

Anomodon attenuatus (Schreb.) Hübén.

Leg. J. J. BARKMAN, 21-4-1951, Middachter bos, De Steeg, between Velp and Dieren, P6.15.12, prov. of Gelderland, on stumps of *Fraxinus* in low moist ash coppice-wood (*Querceto-Carpinetum filipenduletosum*), rel. 723.

This species appears to be very rare in our country, having been found only near Dordrecht and in a few places in S. Limburg.

J. J. B.

Antitrichia curtispindula (Hedw.) Brid.

Leg. J. J. BARKMAN, no. 3573, 28-4-1951, Speulderbos near Garderen, N5.18.13, prov. of Gelderland, on the trunk of an old beech in a beech wood, 1.5-2 m high, W.-NW. side of trunk, 85°-87°, rel. 784, together with *Hypnum cupressiforme* var. *filiforme* (dominant), *Frullania tamarisci* (subdominant) and *Metzgeria furcata* (abundant).

This is the only recent record for the Netherlands of a species, which is probably nearly extinct now in our country. In the last century it still occurred in 27 localities all over the country!

J. J. B.

Breidleria arcuata (Lindb.) Loeske

Leg. J. J. BARKMAN, no. 3604, 23-4-1951, Reëenberg between Apeldoorn and Elspeet, N6.12.11, prov. of Gelderland, along road side in dry oak wood, amongst grasses, in light shade. J. J. B.

Cirriphyllum crassinervium (Tayl.) Loeske

Leg. J. J. BARKMAN: no. 4126, 19-6-1951, Druten, between Nijmegen and Tiel, P5.47.34, prov. of Gelderland; no. 4123, 20-6-1951, Wadenoyen, Geldermalsen, P5.53.23, prov. of Gelderland; no. 4072, 5-7-1951, W. of Nederhemert, Heusden, Q4.28.42, prov. of Gelderland; no. 3515, 20-4-1952, Tienhoven, P4.35.22, prov. of Z. Holland.

All localities are situated in the centre of our country. The specimen from Tienhoven belongs to the var. *turgescens* Mol. (new for the Netherlands), which resembles *Isothecium viviparum* (Neck.) Lindb. very much. Care should be taken not to confound the two mosses when found in sterile state.

All finds mentioned above are on the base of pollard-willows (inundated in winter) in the foreland of our rivers (resp. Waal, Linge, Maas and Lek). The species had not been recorded for our country since 1893; before that time it was known from 5 localities only, three of which were also along rivers, viz. Rotterdam, Kralingen and Zwijndrecht; the other two were situated in the cretaceous district in the extreme S. E. (St. Pietersberg and Geulem), on marl.

J. J. B.

Cryphaea arborea (Huds.) Lindb.

Leg. J. J. BARKMAN: no. 3695, 16-8-1951, Franeker, H5.65.23, prov. of Friesland, on base of old elm tree along road side, rather exposed, rel. 1181; no. 3653, 1-9-1951, de Muy near de Koog, J4.23.21, isl. of Texel, prov. of N. Holland, rel. 1240; no. 3651a, 22-8-1952, N. of Zandvoort, M3.38.12, prov. of N. Holland, rel. 1561; no. 3506, 17-5-1952, W. of Noordwijkerhout, M3.67.33, prov. of Z. Holland, rel. 1511; no. 3511, 30-4-1951, Katwijk, N3.36.13, prov. of Z. Holland, rel. 811; no. 3537, 11-5-1952, W. of Wassenaar, N3.35.43, prov. of Z. Holland, rel. 1510; no. 3523, 12-4-1952, isl. De Beer, Hoek van Holland, P3.22.32, prov. of Z. Holland, rel. 1455; no. 3659, 15-8-1952, isl. of Voorne, P3.41.34, prov. of Z. Holland, rel. 1560; no. 3537a, 16-4-1952, W. of Ouddorp, Q2.16.22, isl. of Goeree, prov. of Z. Holland, rel. 1468; no. 3651, 18-9-1951, Haamstede, Q2.35.33, isl. of Schouwen, prov. of Zeeland, rel. 1323; no. 3648, 24-9-1951, N. of Vrouwenpolder, Q2.63.34, isl. of Walcheren, prov. of Zeeland, rel. 1362.

It may be remarked that the record of WACHTER from Ockenburg S. W. of Den Haag (JANSSEN & WACHTER, 1935) is based on an erroneous determination.

In the previous century this mediterranean-atlantic species was not rare in the Western part of the Netherlands. Nowadays it is extinct nearly everywhere, except in the dunes. The find near Franeker and a find near Nunspeet (Veluwe, prov. of Gelderland) by W. D. MARGADANT are the only recent records outside the dune area. All recent finds, except Franeker, were on stems of *Sambucus nigra*.

In the dunes I discovered the species in many new localities. This

is probably due to the fact that its very special habitat here had never thoroughly been searched: it always occurs in very dense thickets in valleys near the sea. These thickets are nearly impenetrable. Moreover, though occurring nearly everywhere in the dunes, the species is far from abundant. One often has to examine thoroughly the stems of 50 or 100 shrubs of *Sambucus*, before finding one small tuft of *Cryphaea*.

J. J. B.

Dialytrichia mucronata (Brid.) Limpr.

Leg. W. D. MARGADANT, 26-8-1945, in a culvert near Kolland, Amerongen, prov. of Gelderland; leg. S. GROENHUIJZEN: 8-6-1947, Zaltbommel, prov. of Gelderland, on basalt blocks on banks of the Waal; 29-7-1948, near Lexkesveer, opposite Wageningse berg, prov. of Gelderland, in fenland at base of pollard willow; leg. J. J. BARKMAN; no. 2958, 21-4-1952, Schoonhoven, P4.34.41, prov. of Z. Holland, rel. 1498; no. 3532, 20-4-1952, W. of Vianen, P4.27.32, prov. of Z. Holland, rel. 1487 and 1488; no. 3603, 19-4-1952, Randwijk S. E. of Wageningen, P5.38.12, prov. of Gelderland, rel. 690 and 691; no. 4102, 18-6-1951, Ewijk, W. of Nijmegen, P5.58.21, prov. of Gelderland, rel. 880; no. 4022, 23-7-1951, Zevenaar, S. E. of Arnhem, P6.45.11, prov. of Gelderland, rel. 1003; no. 3594, 22-4-1951, Rheden, between Velp and Dieren, P6.15.31, prov. of Gelderland, rel. 727; no. 3696, 11-10-1951, between Wijhe and Zwolle, M6.26.33, prov. of Overijssel, rel. 1398.

If not mentioned otherwise, the habitat of these specimens is on the base of pollard-willows in foreland of rivers, submerged during the winter; so only a few were found on stony substratum. The last two localities are situated along the river IJssel, the others along the Rhine (Lek and Waal). It is remarkable that this mediterranean species was found up to the Dutch-German frontier (Zevenaar), but seems to be lacking in W. Germany.

J. J. B., S. G. and W. D. Marg.

Diphyscium foliosum (Hedw.) Mohr

Leg. S. GROENHUIJZEN and W. D. MARGADANT, 29-7-1949, hills near Mook, prov. of Limburg.

Fertile specimens were collected on a shady bank of a sunken road. This is, to our knowledge, the first find in our country in this century. The last reference to this species was by W. H. WACHTER (1932), who mentions it from the very old collection of J. L. FRANQUINET.

S. G. and W. D. Marg.

Dolichotheca silesiaca (Selig.) Fleisch.

Leg. J. J. BARKMAN: no. 4118, 16-6-1951, Watermeerwijk near Berg-en-Dal, Nijmegen, P6.63.34, prov. of Gelderland, on the trunk of an old birch in a rather dense, young oak wood, rel. 865; no. 3697, 10-10-1951, Diepenveen, N. of Deventer, M6.66.11, prov. of Overijssel, on the base of a young oak in dry brush wood, rel. 1395.

These are the most eastern records of an essentially western species in the Netherlands.

J. J. B.

Fissidens cristatus Wils.

Leg. J. J. BARKMAN, 21-4-1951, Middachter bos, De Steeg, between Velp and Dieren, P6.15.12, prov. of Gelderland, on stumps of *Fraxinus* in low moist ash coppice-wood (*Querceto-Carpinetum filipenduletosum*), rel. 723.

The only Dutch finds hitherto known were situated in S. Limburg (5 localities). J. J. B.

Mnium serratum Schrad.

Leg. R. DE BRUIN, Rijksherbarium no. 943.235.328, April 1944, Beversluisplaat, Biesbos, prov. of Z. Holland; leg. S. GROENHUIJZEN, Aug. 1946, Ratumse beek, Winterswijk, prov. of Gelderland; leg. W. D. MARGADANT, no. 854, 8-4-1950, Grote Valkse beek, Barneveld, prov. of Gelderland, on steep, shaded bank of brook; leg. J. J. BARKMAN: no. 3636, 3-7-1951, Lage Zwaluwe, Q4.32.31, prov. of N. Brabant, rel. 905; no. 3635, 19-7-1951, Heerjansdam, P3.67.23, prov. of Z. Holland, rel. 970; 22-7-1951, Biesbos, Q4.23.14, prov. of N. Brabant, rel. 998; no. 4035, 26-7-1951, Bekkendelle, Winterswijk, P7.36.11, prov. of Gelderland, rel. 1022.

Hitherto *Mnium serratum* had only been found in S. Limburg in the extreme S. E. of our country (calcareous district) on dry, much shaded banks in woods, on marl, and in one locality outside this district: Assinkbrug near Eibergen, prov. of Gelderland, leg. R. VAN DER WIJK, Aug. 1936 (mentioned by WACHTER (1937) under the name of *Mnium riparium*, which it is not). The habitat of the localities outside Limburg is a different one, i.e. either on moist banks of brooks or on the base of pollard-willows in dense, low willow-coppice on river clay, flooded by fresh water twice a day. The specimen of DE BRUIN and those of BARKMAN, except the last one, were found growing in the last mentioned habitat. Because of the daily submersion the mosses are covered with a thin layer of clay here.

Part of the Limburg specimens and no. J. J. B. 3635 belong to the var. *dioicum* H. MÜLL. = *Mnium riparium* Mitt. It must be remarked however, that the specimen from Heerjansdam was sterile; it is considered to be the var. *dioicum* on account of the much shorter and broader, ovate leaves and the smaller leaf cells (18-25 μ).

J. J. B. and W. D. Marg.

Neckera pumila Hedw.

Leg. J. J. BARKMAN: no. 2872, 23-9-1950, "Groot Zeewijk", Warffum, G7.53.34, prov. of Groningen, on an elm tree at the edge of and protected from sea winds by a park, rel. 529; no. 4048, 5-8-1951, between Zutphen and Doesburgh, N6.66.32, prov. of Gelderland, on the base of an old pollard-willow (submerged in winter) in foreland of river IJssel, rel. 1078.

The habitat in both localities is more typical of *Neckera complanata*. Moreover, the leaves of no. 2872 are rather falcate, only partly and indistinctly undulate (both wet and dry) and the tufts are rather

robust and very glossy. Still I consider this specimen to belong to *N. pumila*, since one leaf margin is widely incurved and both are narrowly reflexed. The leaves are only 1.6 mm long, with short cells (1 : 5) and non-porose walls, the larger nerve reaches 1/4 of the leaf length. Flagelliform branches do not occur; instead, the minutely leaved, deciduous ramuli, characteristic of *N. pumila*, are present in the axils of the upper stem leaves. In no. 4048 the leaves are not falcate and more undulate, rather obtuse and crenulate near apex and still shorter (1.2–1.5 mm). Their cells are shorter, too (3–5 : 1), incrassate and non-porose. Only normal branches were observed; these were numerous and short.

The record of Warffum is the northernmost find of this species in the Netherlands, where it is very rare now, mainly occurring on the N. Veluwe (prov. of Gelderland).

var. **philippeana** (B. et S.) Milde

Leg. E. AGSTERIBBE, no. 1232, 30–4–1950, Solse Gat, N. Veluwe, prov. of Gelderland, in a fairly young beech wood on beech, together with *Metzgeria furcata* and *Frullania tamarisci*; leg. J. J. BARKMAN: no. 3601, 25–4–1951, Vierhouster bos, M6.52.13, N. Veluwe, prov. of Gelderland, same habitat, rel. 762; no. 3550, 24–4–1951, Elspeter bos, M6.61.23, N. Veluwe, prov. of Gelderland, same habitat, rel. 749.

No. 3601 is a mixture of the typical form and the var. *philippeana*, no. 3550 consists of the var. *philippeana* only. E. A. and J. J. B.

Orthodicranum flagellare (Hedw.) Loeske

Leg. W. D. MARGADANT et N. E. NANNENGA-BREMEKAMP, herb. N. E. N.–B. no. 730, 2–4–1950, Oranje Nassau Oord, Wageningen, prov. of Gelderland, in beech wood; leg. N. E. NANNENGA-BREMEKAMP, no. 2383, 4–6–1953, Kievitsdel, Heelsum, prov. of Gelderland, in beechwood.

Our specimens have no flagellae.

W. D. Marg. and N. E. N.–B.

Orthotrichum diaphanum Schrad. with gemmae.

Leg. J. J. BARKMAN, no. 2866, 25–9–1950, Delfzijl, H7.18.33, prov. of Groningen, on the trunk of an old elm tree in a group of trees, 500 m from the sea coast, rel. 553.

The gemmae are found on the laminae and margins of the leaves and consist of unbranched green filaments of 3–7 cells each.

AMANN & MEYLAN (1912), HUSNOT (1884–1894) and LIMPRICHT (1890–1904) do not mention gemmae at all for this species, BROTHÉRUS (1923), MOENKEMEYER (1927) and WARNSTORF (1906) include them in their diagnosis of the species. DIXON (1924) suggests them to be restricted to the var. *aquaticum* Davies ex Venturi, but in the original description of that variety (VENTURI, 1873) nothing is said about gemmae and from the description it appears that the var. *aquaticum* was based on quite different characters (broader leaves, shorter hair-

points which are pellucid, but yellowish-green, not hyaline). The specimens with gemmae do not differ in any other features from the species as such. Since gemmae are rare, however, it seemed worth while to mention this find.

It may be remarked, that the key to the species of *Orthotrichum* in DIXON's Handbook needs an emendation both for this form and for the gemmiferous form of *O. tenellum* (see above), as the key leads to *Orthotrichum lyelli* in both cases.

J. J. B.

***Orthotrichum obtusifolium* Schrad.**

Leg. J. J. BARKMAN: no. 4070, 5-7-1951, W. of Nederhemert, Heusden, Q4.28.42, prov. of Gelderland, on the trunk of a pollard-willow in a meadow, rel. 925; no. 3650, 7-9-1951, Nes, G5.58.24, isl. of Ameland, prov. of Friesland, on old elm tree in village, rel. 1304.

In both specimens the stems are very short and turgid with the densely imbricated, short, obtuse leaves. The nerve ends below the apex, the leaf cells are rounded and papillose. Gemmae are abundant on the lamina. For these reasons I consider both specimens to belong to *Orthotrichum obtusifolium*. However, both have leaves with strongly recurved instead of incurved margins! Now, this very character separates the genus *Stroemia* (to which this species belongs) from the genus *Orthotrichum*. I therefore prefer (joining the opinion of DIXON 1924, and MOENKEMEYER, 1927) not to separate the two genera. Perhaps these specimens have to be considered as a new species of *Orthotrichum*, but even then this new species only differs from *Stroemia obtusifolia* (Schrad.) Hagen by the form of the leaf margin. Dr F. OCHSNER (Muri, Switzerland), to whom I sent the no. 3640, wrote to me: ". . . Was könnte es anders sein als *Orthotrichum obtusifolium*, wie ich es auch aus der Schweiz kenne. . . Dass es sich um eine besondere Moosform handelt, ist mir klar geworden. Ich würde sie aber, trotz der grösstenteils umgerollten Blattränder, in den Verwandtschaftskreis von *Orth. obtusifolium* stellen. Bei den männlichen Exemplaren waren nämlich die Blattränder grösstenteils flach, wie beim wirklichen *O. obtusifolium*" (the laminae of the leaves are very concave in no. 3640, so that in the male plants the general outline of the leaves, as seen in cross-section, approaches that of genuine *obtusifolium*). Moreover OCHSNER found a few leaves with truly incurved margins and he remarks that the terms "eingerollt" (incurved) and "umgerollt" (recurved) are not clearly distinguished by all authors. MOENKEMEYER (1927) for instance describes the leaves of *O. obtusifolium* as "schwach eingebogen" (p. 626), but in his key (p. 605) as "schwach umgerollt"! The latter term is also used by GAMS (1940) and PICCIOLI says (p. 102): "feuilles . . . peu révolutes sur les bords". Finally OCHSNER remarks: ". . . auf die Art der Blattränder abzustellen, um eine neue Gattung zu kreieren, scheint mir doch etwas gewagt zu sein (Siehe auch die Bemerkung von MOENKEMEYER, 1927, S. 626)."

J. J. B.

***Orthotrichum pulchellum* Brunt.**

Leg. J. J. BARKMAN: no. 4034, 26-7-1951, Bekkendelle, Winterswijk,

P7.36.11, prov. of Gelderland, on the trunk of an elm tree in moist deciduous forest along a brook (*Querceto-Carpinetum filipenduletosum*), 2–3 m high, rel. 1034; no. 3652, 1–9–1951, de Muy near De Koog, J4.23.21, isl. of Texel, prov. of N. Holland, on base of trunk of *Sambucus nigra* in a thicket on top of a low dune ridge near the sea, rel. 1240; no. 3658, 15–8–1952, isl. of Voorne, P3.41.34, prov. of Z. Holland, on the extreme base of *Sambucus nigra* in a thicket on the slope of a dune near the sea, rel. 1560. The first of these records was in the *Ulotetum bruchii*, the second and third in the *Cryphaetum arboreae*.

The Prodrômus (1893) cites this species from Helpen, Leeuwarden, Eelderwolde, Utrecht, Maartensdijk and Leiderdorp. Like so many other epiphytic mosses in the Netherlands, this species has become very rare now. It is an atlantic species, occurring in Norway, Denmark, N. W. Germany, the Netherlands, Great-Britain and N. France. In Germany, according to MOENKEMEYER (1927), it is rare inland and mainly distributed in the coastal region of the North Sea. J. J. B.

Plagiotheciella latebricola (Wils.) Fleisch.

Leg. W. D. MARGADANT et N. E. NANNENGA-BREMEKAMP, herb. N. E. N.-B. 731, 2–4–1950, Molenbeekdal, Renkum, prov. of Gelderland, on treestump; leg. J. J. BARKMAN: no. 3576, 21–4–1951, Middachter bos, De Steeg, between Velp and Dieren, P6.15.12, prov. of Gelderland, on decaying wood of an old alder stump in wet alder coppice-wood (*Alnetum glutinosae cardaminetosum amarae*); no. 4109, 14–6–1951, "Het Broek", Hatert, S. W. of Nijmegen, Q6.11.24, prov. of Gelderland, on the base of old oaks in dense, tall, shady, moist oak wood (*Querceto-Carpinetum stachyetosum*), rel. 853; no. 3666, 19–6–1951, Bergharen, Druten, between Nijmegen and Tiel, P5.57.41, prov. of Gelderland, on the base of a tall oak in oak wood with scattered trees and dense undergrowth of shrubs, on moist sand. Much shaded (N. side of trunk), rel. 888.

J. J. B., W. D. Marg. and N. E. N.-B.

Tortula pulvinata (Jur.) Limpr.

Leg. J. J. BARKMAN: no. 3639, 4–9–1951, Midsland, H5.12.12, isl. of Terschelling, prov. of Friesland, on trunk of elm tree in village, rel. 1272; no. 3644, 7–9–1951, Nes, G5.58.24, isl. of Ameland, prov. of Friesland, same habitat, rel. 1303; no. 4105, 18–6–1951, Ewijk, W. of Nijmegen, P5.58.21, prov. of Gelderland, on a pollard-willow in foreland of river Waal, rel. 879; no. 4073, 7–7–1951, Beesd, between Leerdam and Geldermalsen, P5.51.12, prov. of Gelderland, on a pollard-willow in foreland of river Linge, rel. 944; no. 4172, 2–5–1953, Oostvoorne, P3.41.24, prov. of Z. Holland, on trunk of old *Sambucus* in moist dune valley near the sea.

All specimens have a central strand in the stem, an emarginate to obcordate leaf apex, a leaf margin which is only recurved in the lower half (in no. 3644 flat throughout) or only one margin narrowly recurved at base. The leaf cells are rather large (12–15 μ). The nerve is nearly smooth at back (except in no. 4172) and forms a long,

hyaline arista, brownish at base. The arista is only slightly rough, except in no. 4172, where it is strongly so. The plants are dioicous. No. 4073 differs somewhat from normal *Tortula pulvinata* by the tall stems, the very long (4–5 mm) and narrow leaves, which are strongly recurved when moist, and the brown hair-points. In no. 4172, too, the leaves are squarrosely recurved when moist, though not strongly. This specimen resembles *Tortula ruralis* in every respect, except the central strand. Obviously the two species are closely related.

All finds hitherto known from the Netherlands (Heer en Cadier, Grave, Maarsse, Kampen) were on stony substratum. J. J. B.

B. HEPATICAE

Bazzania trilobata (L.) Gray

Leg. N. E. NANNENGA-BREMEKAMP: no. 662, 22–2–1950, Kievitsdel, Beekdal, Heelsum, prov. of Gelderland; no. 1596, 3–6–1951, Kasteelweg, Beekdal, Heelsum, prov. of Gelderland.

First records outside the hills of Nijmegen. N. E. N.-B.

Lophocolea minor Nees

Leg. J. J. BARKMAN: no. 3572, 21–4–1951, Middachter bos, De Steeg, between Velp and Dieren, P6.15.12, prov. of Gelderland, on stumps of *Fraxinus* in low moist ash coppice-wood (*Querceto-Carpinetum filipenduletosum*), rel. 723; no. 4023, 26–7–1951, "Te Lintum", Winterswijk, P7.36.13, prov. of Gelderland, on upper side of fallen, decaying trunk of spruce in young spruce plantation, much sheltered, rather shady, rel. 1017.

Leaves abundantly gemmiferous in both specimens. Remarkably enough, I also observed (in no. 3572) gemmae on a few amphigastria, contrary to the statement of MÜLLER (1916, 1: 811: "Die Unterblätter bleiben von der Gemmenbildung verschont").

In the Netherlands this species only occurs in the calcareous, subcentreupe and fluviatile districts: several finds in S. Limburg (Prodromus Florae Batavae, 1893: 154), one near Venlo (GARJEANNE, 1927) and one near Voorst (Zutphen, Gelderland; according to MEYER DREES, 1936). The last mentioned locality and mine are both situated on clay of the river IJssel (fluviatile district).

The Dutch localities constitute the most Western ones of the species area. J. J. B.

Lophozia mildeana (Gottsche) Schiffn.

Leg. W. MEYER, 1951, in a sand-pit, Hargen, Schoorl, prov. of N. Holland, det. H. PERSSON.

W. H. WACHTER first discovered this liverwort for the Netherlands among old herbarium material of the Koninkl. Nederl. Bot. Vereniging (JANSSEN & WACHTER, 1939). This species has a preference for sand-pits. W. M.

Orthocaulis attenuatus (Mart.) Evs.

Leg. C. ENGELFRIET Jr., herb. W. D. MARG. no. 1172, 4–1952, Posbank, Arnhem, prov. of Gelderland, in tufts of *Leucobryum*; leg. N. E.

NANNENGA-BREMEKAMP: no. 1265, 24-3-1950, Kasteelweg, Beekdal, Heelsum; no. 708, 28-3-1950, Kievitsdel, Beekdal, Heelsum; no. 1378, 30-9-1950, Beek, Nijmegen (all localities in the prov. of Gelderland).
W. D. Marg. and N. E. N.-B.

Plectocolea hyalina (Lyell) Mitt.

Leg. E. AGSTERIBBE, no. 1231, 29-4-1951, Trichterberg, V6.31.31, prov. of Limburg, on the steep side of a sunken road.

This species prefers loamy roadsides and occurs all over Europe.
E. A.

Sphenobolus minutus (Crantz) Steph.

Leg. N. E. NANNENGA-BREMEKAMP: no. 359, 21-2-1950, Kievitsdel, Beekdal, Heelsum; no. 709, 28-3-1950, Kasteelweg, Beekdal, Heelsum (both prov. of Gelderland).

Collected by BUSE in 1854 in practically the same place as I have found it a century later again.
N. E. N.-B.

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